

1. (Twice Amended) A process for the production of difluoromethane comprising:

(a) contacting dichloromethane with hydrogen fluoride in the presence of a fluorination catalyst to produce a product stream of difluoromethane, chlorofluoromethane, and unreacted starting materials and

(b) separating difluoromethane from the product stream from step (a) comprising distilling the product stream from step (a) to separate a top stream comprising difluoromethane and hydrogen chloride from a bottom stream comprising hydrogen fluoride, chlorofluoromethane and unreacted dichloromethane, wherein sufficient hydrogen fluoride is employed in the process such that during step (b) the molar ratio of hydrogen fluoride to chlorofluoromethane is at least about 100:1.

2. (Amended) A process as claimed in claim 1, wherein the molar ratio of hydrogen fluoride to chlorofluoromethane is at least about 150:1.

3. (Amended) A process as claimed in claim 1 wherein additional hydrogen fluoride is added to the process stream recovered from step (a) in order to ensure that the required ratio of hydrogen fluoride to chlorofluoromethane is achieved during step (b).

4. (Amended) A process for the production of difluoromethane comprising (a) contacting dichloromethane with hydrogen fluoride in the presence of a fluorination catalyst to produce a product stream comprising difluoromethane, chlorofluoromethane and unreacted starting materials,

(b) separating difluoromethane from the product stream from step (a) comprising distilling the product stream from step (a) to separate a top stream comprising difluoromethane and hydrogen chloride from a bottom stream comprising hydrogen fluoride, chlorofluoromethane and unreacted dichloromethane, and

(c) recovering difluoromethane and recycling chlorofluoromethane to step (a),

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wherein sufficient hydrogen fluoride is employed in the process such that during step (b) the molar ratio of hydrogen fluoride to chlorofluoromethane is at least about 100:1.

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6. (Twice Amended) A process of claim 4 wherein the fluorination catalyst comprises a metal oxide, metal fluoride or oxyfluoride.

7. (Amended) A process as claimed in claim 6 wherein the metal of the oxide, fluoride, or oxyfluoride is at least one of chromium, aluminum, zinc, nickel, cobalt, copper and magnesium.

8. (Amended) A process as claimed in claim 7 wherein the catalyst comprises zinc or a compound of zinc and a metal oxide, fluoride or oxyfluoride in which the metal of the oxide, fluoride or oxyfluoride is chromium or aluminum.

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9. (Twice Amended) A process for producing difluoromethane comprising the steps of:

(A) preheating a composition comprising hydrogen fluoride and dichloromethane to form a vaporized and superheated composition;

(B) reacting the preheated composition of step (A) in the presence of a fluorination catalyst under conditions suitable to form a product stream comprising difluoromethane, chlorofluoromethane, hydrogen chloride, dichloromethane and hydrogen fluoride;

(C) recovering by distillation from the product stream of step (B) a high boiling fraction comprising hydrogen fluoride, dichloromethane, and chlorofluoromethane and a low boiling fraction comprising difluoromethane, hydrogen chloride, hydrogen fluoride, and reaction byproducts; and

(D) recovering substantially pure difluoromethane from the low boiling fraction of step (C).

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wherein the hydrogen fluoride and the chlorofluoromethane are present in the product stream in a mole ratio of from about 25:1 to about 75:1.

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15. (Amended) The process of claim 1 wherein the fluorination catalyst is a pretreated fluorination catalyst.

16. (Amended) The process of claim 1 wherein the fluorination catalyst is chromium oxide.

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18. (Amended) The process of claim 9 wherein step (D) further comprises the substeps of:

(E) treating the low boiling mixture of step (C) in an hydrogen chloride distillation column or an aqueous hydrogen chloride absorption tower under conditions suitable to remove hydrogen chloride and trace hydrogen fluoride to form a crude difluoromethane product;

(F) treating the crude difluoromethane product formed in step (E) with a first caustic scrubber under conditions suitable to form a neutralized product;

(G) treating the neutralized product of step (F) in a second caustic scrubber under conditions suitable to form a substantially chlorine-free product;

(H) treating the substantially chlorine-free product of step (G) with a sulfuric acid scrubber and subsequently with a solid desiccant to form a substantially moisture-free product; and

(I) distilling the substantially moisture-free product of step (H) under conditions suitable to produce substantially pure difluoromethane.

Please add new claims 21 and 22 as follows:

21. The process of claim 9 wherein the fluorination catalyst is a pretreated fluorination catalyst.

22. The process of claim 9 wherein the fluorination catalyst is chromium oxide.

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